Marvine Colliery
W side of Boulevard Ave.,
between E Parker St. and I Rt. 380
Scranton
Lackawanna County
Pennsylvania

HAER No. PA-183

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

Marvine Colliery

HAER No. PA-183

Location: West side of Boulevard Avenue, between East Parker Street (at the south) and Interstate Route 380 (at the north)
Scranton, Lackawanna County, Pennsylvania

UTM: Area bounded by 5 point polygon A, B, C, D, E:
A = Z18 E446213 N4588110
B = Z18 E446124 N4587188
C = Z18 E446066 N4587193
D = Z18 E446058 N4588067
E = Z18 E446188 N4588123

Quad: Scranton

Dates of Construction: 1872 through 1920

Present Owner: Louis and Dominick DeNaples
F & L Realty

Present Occupant: Vacant

Present Use: None

Significance: Marvine Colliery is important to local history for its relationship to the development of the Anthracite Mining Industry in northeast Pennsylvania, "The Anthracite Capital of the World" 1890-1930. A subsidiary of the Hudson Coal Company, of the part company Delaware and Hudson Railroad, the first U.S. railroad to use locomotive power, in 1930 the Marvine Colliery provided public tours as the region's most modern coal processing operation. Marvine Colliery includes the only extant example in Lackawanna County, Pennsylvania, of the Dorr Thickener, used to extract "Anthrafine" or refined anthracite silt, a component in manufactured products and industrial processes, including diaphragms used in American and Canadian telephone transmitters. An intact Fairbanks Morse Platform Scale, the first type of scale invented to weigh loaded railroad coal cars, is also on this site.

Project Information: This documentation was undertaken in April 1990, in accordance with a resolution by the board of commissioners of Lackawanna County, Pennsylvania, as a mitigative measure prior to partial demolition of the Marvine Colliery to make way for construction of the Lackawanna County Recycling Center on the site.

Dorothy Allen Silva
Architectural Historian
1288 Layton Road
Clarks Summit, Pennsylvania 18411

LOCATION

The Marvine Colliery, located in Scranton, Pennsylvania, at the borders between the city of Scranton and the boroughs of Dunmore and Throop, consists of two sites located adjacent to one another. They were divided by the Lackawanna River and operated by one company, the Delaware and Hudson Coal Company (later called the Hudson Coal Company) which was a subsidiary of the Delaware and Hudson Canal Company (later called the Delaware and Hudson Railroad Company).

The entire site consists of a tract of land bounded by East Parker Street and Leggetts Creek at the south, the west side of Boulevard Avenue at the east, Interstate Route 380 at the north, and the east side of North Main Avenue at the west, with the entire tract of land bisected north and south by the Lackawanna River. This study is concerned primarily with the site located to the east of the Lackawanna River. Insurance maps of the city of Scranton, dated 1878, 1888, 1898, 1918, and 1956 identify the site to the east of the Lackawanna River as Marvine No. 2, and the site to the west of the river as Marvine No. 1. However, written records do not distinguish between the two sites. Insurance maps of the city of Scranton indicate that the site west of the Lackawanna River was developed first (1872) and the site to the east of the river was developed circa 1898-1920, with improvements and additional support structures added to each site at various times during the course of the company's operations, 1872-1973. A field examination of the styles of a architecture found on both sites indicate details of architectural styles dating from the 1870s through the early decades of the twentieth century on both sites.

A separate, and much smaller, mining operation, the Scranton Coal Company, is identified on the 1918 insurance maps of the city of Scranton as occupying the southeast corner of the tract identified above.

The existing ruin of a small fan house (designed to hold only one, or possibly two, ventilation fans), located at the extreme southeast corner of this tract, is considered by several local people to have been part of the Marvine Colliery site, although present research has found evidence contrary to this oral tradition. Nevertheless, the fan house is part of the tract of land included in the holdings of the F & L Realty Company, which, at the present time, maintains ownership of the site.

The 1956 Sanborn Insurance Map of Scranton indicates the location of a Marvine Colliery fan house as fronting Boulevard Avenue (the structure being extant and part of holdings of Mike's Scrap Yard). This fan house was constructed circa 1918, in conjunction with the D & H Coal Company's expansion and modernization of the Marvine at that time.

HISTORICAL BACKGROUND

From the date of the first sinking of a coal mine shaft at the western site of the Marvine Colliery in 1872, this anthracite mining and processing site was owned and operated by the Delaware and Hudson Coal Company, which was itself formed from a subsidiary of the Delaware and Hudson Railroad Company.

The area which became Lackawanna County in 1878 from the northernmost portion of Luzerne County was first settled in 1771 by settlers from Rhode Island and Connecticut, and the region remained economically agricultural until the discovery of anthracite coal and the subsequent establishment of the first economically successful coal mining operations by William and Maurice Wurts in Carbondale in 1812. The success of the

Wurts brothers' coal operations was due to the concurrent development of a network of anthracite-carrying railroads which carried the coal to markets in New York. The Delaware and Hudson Canal Company was the first anthracite-carrying transportation system in northeastern Pennsylvania.

The Delaware and Hudson Canal extended from Rondout, New York, to Honesdale, in Wayne County, Pennsylvania, north of Carbondale. To link the mining operations in the Lackawanna Valley to the terminus of the Delaware and Hudson Canal at Honesdale, the D & H Canal Company constructed a gravity railroad. In 1829, the D & H Canal Company purchased four steam locomotives from the Foster, Rastrick Company in Stourbridge, England, and on August 8 of that year, one of those locomotives, the Stourbridge Lion, made a successful run on D & H tracks from Honesdale to Seeleyville, Pennsylvania. The 1829 run of the Stourbridge Lion was historically important, as it was the first steam locomotive to run successfully on tracks in the United States.

By the 1870s, the Delaware and Hudson Railroad Company and the Delaware, Lackawanna, and Western Railroad (D.L.&W.) transported the majority of anthracite coal mined and processed in the Lackawanna Valley. Although Federal regulations harred railroad companies from actually running the mining operations, both the D & H and the D.L.&W. railroads did, in fact, "own" a large number of coal mining and processing sites in northeastern Pennsylvania. These railroad companies managed to sidestep Federal regulations by forming ancillary corporations which operated under the same management as the railroads and also held similar company names. Thus, in the early 1870s, the Delaware and Hudson Coal Company was formed, with the purpose of purchasing land and mineral rigbts to the coal seams beneath. By 1876, the D & H owned and operated nine anthracite mining and coal processing sites in the Lackawanna Valley.

DEVELOPMENT OF THE SITE

The Marvine Colliery first began operations as a D & H coal mining and processing site in May 1872. On that date, the site consisted of a shaft west of the Lackawanna River, sunk to the Diamond Vein, 155 fcet below the surface, with an average thickness of coal at seven feet. The shaft opening was 10 feet wide by 41 feet long. The Reports of the Inspectors of Mines of the Anthracite Coal Regions of Pennsylvania for the Year 1872 reported tbat in that year construction of "very substantial hrick buildings around the shaft for engine house, etc." had been accomplished and the company was also "in the act of huilding a breaker." These early huildings were constructed on the site to the west of the river, of which only three remain.

Mining machinery at that time included two 120-horsepower and two 30-horsepower steam driven hoisting engines to provide stationary lifting power to raise, by means of winding winches, coal laden mining railroad cars on tracks, which ran on a slope from the main underground coal seam to the surface.

By 1874, the Marvine Colliery's Boiler House No. 1 (on the west site) contained nine cylindrical steam boilers, each of whicb measured 36 feet in length and 34 inches in diameter. The Reports of the Inspectors of Mines for that year also reported that an 80-horsepower fan engine had been installed hy that date, to provide an exchange of air from the surface through the mining tunnels for the workers. Extant maps do not indicate where this first fan house was located. In 1901, a second fan was added and, by 1918, four more had been installed, and a new fan house constructed on the site to the east of the river (currently extant; part of Mike's Scrapyard property).

In 1876, the two 120-horsepower and two 30-horsepower hoisting engines that had been in use since 1872 were replaced by three 200-horsepower stream-driven hoisting engines. The Reports of the Inspectors of Mines for that year identified the nine steam boilers as having H. Belfield-type steam gauges. To provide steam power, 4,032 tons of coal fueled the nine boilers in 1875.

The inference can be made from an examination of The Reports of the Inspectors of Mines through the 1870s that, from its inception, the Marvine Colliery was a "modern" operation. In comparing the Marvine Colliery to other collieries operating during that time period in the Lackawanna Valley, the Marvine Colliery's operations relied more on coal-fired steam generation and less on animal (mule) power than any other colliery. By 1875, although other sites used as many as 66 mules, the Marvine used only 4 (their precise function in the Marvine colliery operations has not been determined).

Construction of the Marvine Breaker No. 1, which was begun in 1872 on the west site, was completed in 1875, with one 80-horsepower stream-driven breaker engine installed. Insurance maps indicate that this first breaker was a wooden structure.

The earliest method of processing raw coal was a totally manual procedure. First, the lump coal was broken into smaller pieces by workers using sledge hammers, and then the pieces were chuted over a series of perforated screens through which passed the various sizes of coal.

Impurities, such as slate and other rock matter, were manually removed from among the lumps as it passed down along sloping chutes, usually by young boys (as young as 7 years old), who were known locally as "breaker boys."

The Marvine Breaker, which was constructed in 1875, presented an improvement over the manual methods employed by collieries a decade earlier. The newer method of "breaking" coal at the 1875 Marvine Colliery consisted of a system composed of pairs of cast-iron rollers with projecting "teeth" through which the lump coal was passed and broken into smaller chunks as the steam-driven rollers revolved toward each other. This device was invented and patented by Joseph Batten of Philadelphia and was eventually adopted throughout the anthracite mine collieries, with improvements over time, including replacement of the cast-iron teeth with drop-forged steel teeth and increasing the speed of the revolution of the rollers by installing more powerful driving engines. After passing through the rollers, the coal was then passed over a series of vibrating screens to separate the various sizes; however, impurities were still removed manually.

After an underground mining accident at the Marvine mines in 1886, in which eight men were killed by suffocation after being trapped for hours by the fall of a roof within one of the mine tunnel, which blocked the exchange of air, the State of Pennsylvania enacted Article 10, Section 7 of the Anthracite Mine Law, mandating that a recording instrument be installed to measure the number of hourly revolutions of each mining site fan that provided fresh air to the underground areas.

Mechanical Engineer Edmund Bartl of Scranton, Pennsylvania, invented Bartl's Time and Speed Indicator which enabled mining companies in Pennsylvania to comply with the 1886 law. This device was installed in Fan House No. 1 at the Marvine Colliery in 1886 under the direction of Marvine Colliery superintendents Benjamin Hughes and A. H. Vandling.

In 1886, the Marvine Colliery was equipped with 15 steam boilers and its 380 employees processed 157,075 tons of coal. The colliery continued to expand its operations and, by 1897, the Marvine was equipped with 21 steam boilers, employed 582 men, and processed 288,960 tons of coal. Within one year, another ten steam boilers were added, running twenty-three steam engines with a total of 1,869 horsepower. In 1899, production increased to 323,820 tons, with 631 employees, including below-ground workers, and above-ground workers such as engineers, firemen, blacksmiths, carpenters, slate pickers, and colliery machinery operators.

The operations were expanded again in 1903, with the installation of another 12 cylindrical steam boilers, bringing the total of boilers to 37 and running 28 steam engines, with a total 2,424 horsepower.

Between the years 1898 and 1904, a second boiler house was constructed on the site to the east of the river. It is not known how many cylindrical steam boilers were placed in Boiler House No. 2, as extant photographs depict later (1918) tubular-type steam boilers which replaced them.

In 1918, L. F. Loree, president of the Hudson Coal Company, adopted the Dorr Thickener and Classifier, an apparatus which had been invented to recover non-ferrous metals from silt, to the recovery of anthracite silt. After the raw coal had passed through the breaker and was broken into smaller coal sizes, the very fine particles, which were carried away by the washery water, had been discarded prior to this time. Three Dorr Thickeners were installed at the Marvine Colliery, circa 1918, to recover the fine particles of anthracite smaller than 3/32 of an inch. The recovered anthracite silt, called "Anthrafine," was purchased by a number of manufacturing industries, including those industries that were involved with the production of telephone equipment, paint, and various metallurgical processes. The equipment for the Dorr Thickeners was housed in three identical "silos," which were located at the southeastern end of the site.

In circa 1918, the D & H began a modernization program throughout its anthracite region operations, including the modernization of equipment and the building of a new breaker at the Marvine Colliery. As production had continued to increase from the time of the opening of Marvine Colliery in 1872 through circa 1918, it became apparent that more and more coal-fired boilers would be necessary to provide steam power to drive the additional mining and breaker machinery which had been added during that time period. In preparation for the building of a new breaker, the boiler houses were re-equipped. The existing 37 cylindrical steam boilers were removed and thirteen tubular-type boilers, with a combined 3,450 horsepower, were installed, driving 49 stationary steam engines. The number and placement of the boilers in each boiler house is not known.

In addition, four electric dynamos were installed, with a combined output of 1,200 kilowatts. The electric dynamos were not installed in any building, but, rather, were placed within an outdoor area on the east site near Boulevard Avenue and enclosed by a high wooden fence. The electric dynamos provided power to drive 125 electric motors, with a combined 8,263 horsepower.

With the installation of electric power, two electric-powered ventilation fans were also installed in a new fan house constructed in circa 1918 on the east site.

The D & H constructed a steel and concrete breaker in 1920, which cost $2,500,000. By 1930, the yearly market production in the two Marvine breakers reached 2,279,518 tons. Considered by the D & H to be an example of the most modern colliery operations at that time, the Marvine Colliery's Breaker No. 2 was opened to the public for tours, and company guides provided tours of the facility to 15, 210 persons in that year. By 1930, the new Breaker No. 2 featured a method of separation of impurities from raw coal which was considered by the D & H to be a tremendous improvement over the previous methods.

In the 1930s, the D & H used two different types of equipment for the separation of impurities from coal in its breakers. In the new Breaker No. 2 (circa 1930), the D & H installed equipment for the Sand Flotation Method to separate impurities from the coal. Invented by Dr. Henry M. Chance of Philadelphia in 1921, this system relied on the differing specific gravity of coal versus rock matter. When coal and rock were dumped into a Chance Cone with water and sand, then agitated, the heavier rock would settle to the bottom and be drawn off, with the lighter coal remaining at the top. A typical Chance Cone consisted of a steel "cone," tapering from 15 to 18 feet at the top to about 2-1/2 feet at the bottom. Agitator arms attached to a central shaft kept the materials in motion.

The second method used for removal of impurities from coal in D & H breakers during the early 1930s was the Jig Method, which was employed at the Marvine Colliery in its older Breaker No. 1, as well as in the new Breaker No. 2 at the time of its construction in 1920. It is assumed that the newer Chance Cones were installed circa 1930 only in Breaker No. 2, for in a D & H publication dated 1932, the company stated that the new sand flotation equipment was installed only in its most newly-constructed breakers.

A jig was composed of a large water-tight metal "box" which was divided horizontally by sloping, perforated plates. The box was filled with water, and unseparated coal and rock were dumped into the upper compartment. A tight-fitting wooden plunger moved up and down in the lower compartment, causing the water to agitate through the perforated plates. This method also relied on the differing specific gravity of lighter coal and heavier rock. With agitation, the heavier rock material would slide downward along the sloping plate toward the bottom front of the box, where it would be removed by opening a hinged gate, and the lighter coal would remain at the top rear of the box, where it was removed.

The D & H continued to operate two breakers on the Marvine Colliery site until approximately 1930, designating the older 1875 breaker on the west site as Breaker No. 1 and the 1920 breaker on the east site as Breaker No. 2.

To pump out water that had accumulated in the underground tunnels, and to pump water from nearby rivers for use in the west processing of coal, the D & H had installed a number of pumping stations at various sites throughout its operations. As an underground survey of the Marvine workings is not undertaken at this time, it is not possible to determine what type and capacity underground pumping apparatus was employed at the Marvine site.

The Marvine Colliery's underground pumping operation appears to have been on a much smaller scale than the D & H pumping operation at its Jermyn Colliery, which was located in an excavation made in solid rock, 270 feet below the surface, and had a capacity of 33,000 gallons per minute. However, the Jermyn Colliery was identified as having eight pumps in 1927.

The Reports of the Bureau of Mines for 1927 reported that the Marvine Colliery and Mines also operated eight pumps underground, plus an additional 55 above-ground pumps. Since, in 1920, the D & H Marvine Colliery had constructed a new breaker which separated impurities from coal by the "wet" Chance Cone method (which required large quantities of water), it seems reasonable to assume that the majority of the pumping operation at the Marvine was located above ground and had the objective of delivering water from the Lackawanna River to the breakers for use in the preparation of coal for market. It also appears logical that the additional boilers reported in the Reports of the Bureau of Mines were needed to run the pumping apparatus.

Although the D & H had installed new equipment in circa 1918 to provide both steam and electrical power to drive the Marvine Colliery and mining machinery, by 1936, the company had decided instead to purchase electrical power from the local electric utility company. It is not known why this decision was made; however, with the conversion to new sources of power (both electrical and petroleum-based) for industrial use throughout the United States, the same power sources which allowed anthracite mining operations to become more modern and efficient, were ironically also responsible for the decline in demand for anthracite coal as a fuel.

The conversion hy American industries to power sources other than coal marked the end of the golden age of anthracite mining, and from the late 1930s onward, all anthracite coal mining operations faced a struggle for economic survival due to the sharply-decreasing demand for coal. The Marvine Colliery faced this same problem, and was able to survive longer than most collieries in the region; however, production continued to decrease as the years went by.

An examination of the Annual Reports of the Anthracite Division of the Commonwealth of Pennsylvania Department of Mines and Mineral Industries for the years 1931 through 1945 tell a compelling tale of the demise of the anthracite coal industries, as the following table demonstrates a decline in production, number of employees, and days worked throughout the period. This decline cannot be explained by attributing the steady downturn only to the effects of the Great Depression (1929-1939), for while other industries, such as the steel industry, recovered during the decade of the 1940s, the anthracite coal industries continued to decline through the 1940s and 1950s and met a final demise in the 1960s. There are few anthracite mining operations in northeastern Pennsylvania at this date (1990) and production is limited.

After the end of the Great Depression, production at the Marvine Colliery (as well as at other anthracite collieries) increased a small amount during the early 1940s over the amounts produced in the late 1930s (possible due to increased demand for fuel to power the industries which produced weaponry and heavy industrial supplies during the years of the U.S. involvement in World War II. However, production never again increased to the levels seen in the 1930-1932 period.

Declining Production at Marvine Colliery 1932-1945

Date	Total Production	No. Employees	No. Days Worked
1932	673,801 tons	1,296	209
1934	607,445 tons	701	298
1937	439,779 tons	805	205
1938	293,111 tons	725	189
1945	301,053 tons	559	283

In 1973, there were 51 coal companies, 35 mines, and 31 coal cleaning plants in the entire anthracite district. The combined production in that year for all 51 companies was 6,553,000, with the average coal company production at 128,490 tons, over 50% of which represented coal extracted by the strip mining method and another 35% representing extraction of coal or coal derivatives from "culm" banks where refuse from breaker operations had been dumped during the previous century of anthracite coal production. Underground anthracite mining accounted for only 15% of coal production in 1973.

In that year, the Marvine Breaker was used only for packaging and local shipping of Hudson coal that had been processed at the company's Huber Breaker (built by the D & H circa 1938) in Ashley, Luzerne County. Marvine Colliery ceased operations entirely soon after 1973, the bulk of the equipment was removed, and Breaker No. 2 was demolished, remaining as a heap of twisted steel and concrete.

See HAER No. PA-183-A through PA-183-H for descriptions and current status of remaining structures and equipment.

MARVINE COLLIERY: RELATED STRUCTURES

Structures which were part of the Marvine Colliery, in addition to those mentioned in the above descriptions, included:

Company Office (circa 1930)

The Marvine Colliery company office was located on the extreme end of the west site, facing North Main Avenue, south of Reese Street. It is a two-story rectangular brick structure and is currently in use as a labor union office.

Miners' Changing Room and Wash House No. 1 (circa 1918)

The Miners' Changing Room No. 1 was located directly south of the company office and also fronts North Main Avenue. It was a one-story rectangular brick structure. It is part of the property of Concrete Step Units, Inc., and, in 1900, a new structure was built around it and the older structure is currently in the process of being removed.

Miners' Changing Room and Wash House No. 2 (circa 1920)

The Miners' Changing Room No. 2, located on the east site, southwest of Fan House No. 2, was a one-story brick structure. An historical pbotograph of the interior of this structure exists in the archives of the Anthracite Heritage Museum in Scranton, Pennsylvania. A changing room contained rows of galvanized iron buckets suspended on chains from pulleys near the ceiling. The mine worker would place his valuables and shoes in the bucket, hang his clothing on a hook at the bottom of the bucket, pull the chain to hoist the bucket to the ceiling, and place a lock on the chain. The Miners' Changing Rooms were steam heated, and hot and cold water was provided for showers.

Hoisting Engine House No. 1 (circa 1873)

Hoisting House No. 1 was located on the west site, northeast of the company office. It is a rather small, one-story brick structure composed of a rectangular west portion adjoining a rectangular east portion. It is currently in use and is part of the property of Wayne Crusbed Stone.

Washery Pump House (circa 1898)

The Washery Pump House, a small square stuccoed masonry building, was constructed on the east site, north and slightly west of Breaker No. 2, on the east bank of the Lackawanna River in the vicinity of the washery pools and pumps.

Cable Engine Room (circa 1920)

The Cable Engine Room was a support structure, constructed at the same time as Breaker No. 2 on the east site, north of the breaker.

Mining Shaft No. 2 Head House (circa 1918)

The Head House at Shaft No. 2 was located on the east site, directly behind Fan House No. 2 which fronts Boulevard Avenue. This area is currently part of the property of Mike's Scrap Yard.

Hoisting Engine House No. 2 (circa 1918)

Hoisting Engine House No. 2 was constructed at the time of the sinking of Mining Shaft No. 2 on the east site to house the stationery steam engines which raised loaded coal cars from the underground areas at this location. It was located directly southwest of Shaft No. 2, currently part of the property of Mike's Scrap Yard.

Carpenter Shop (circa 1918)

The Carpenter Shop was located on the east site, directly west behind Hoisting Engine House No. 2, currently part of the property of Mike's Scrap Yard.

Other Structures

A number of very small support structures, such as supply sheds, motor sheds, meter sheds, and pump sheds were constructed on the site. Most of them have been removed, with foundations remaining. A structure made of wooden timbers resembling railroad ties, and possible used as a coal car loading dock, also remains north of Breaker No. 2.

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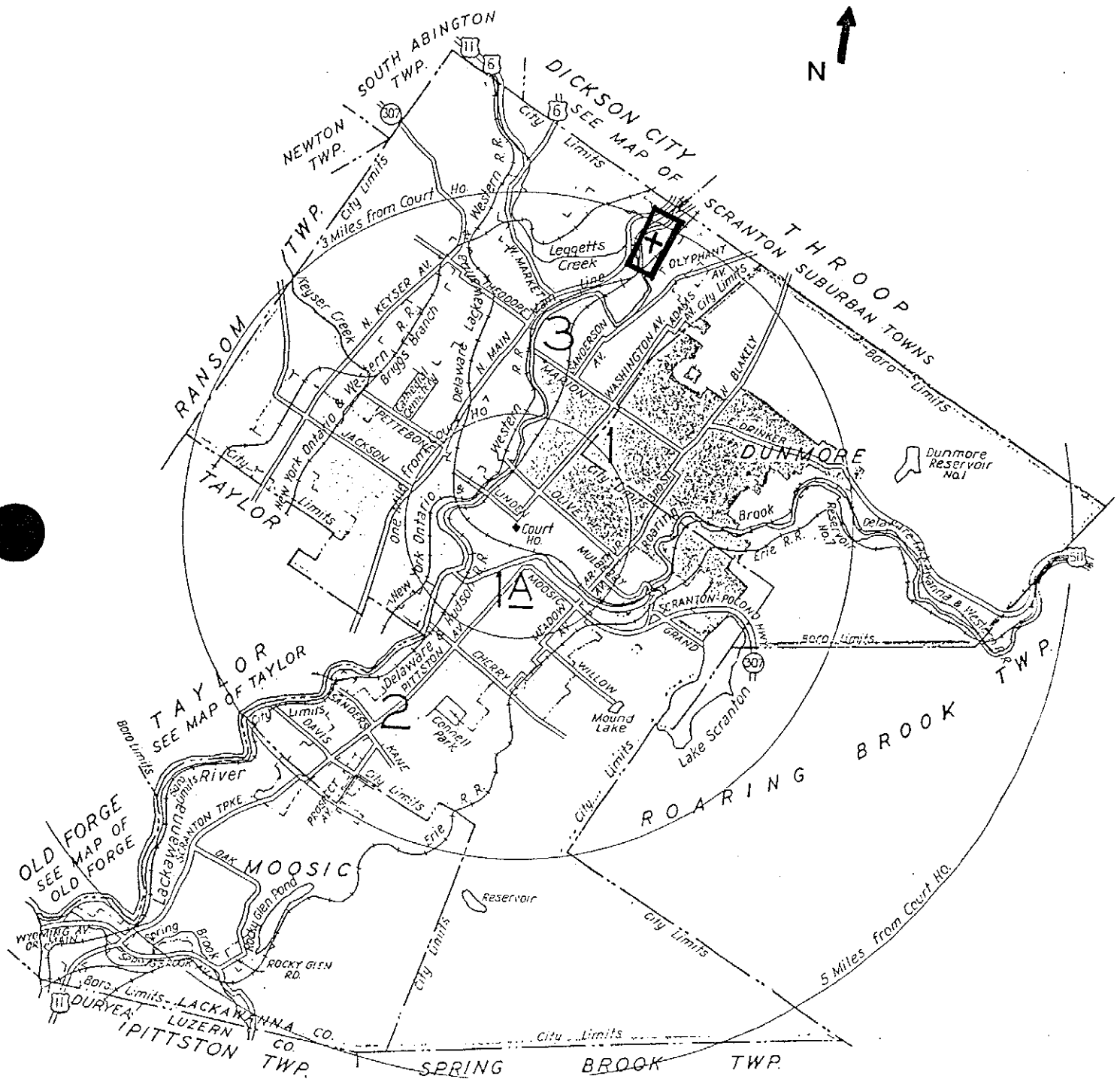
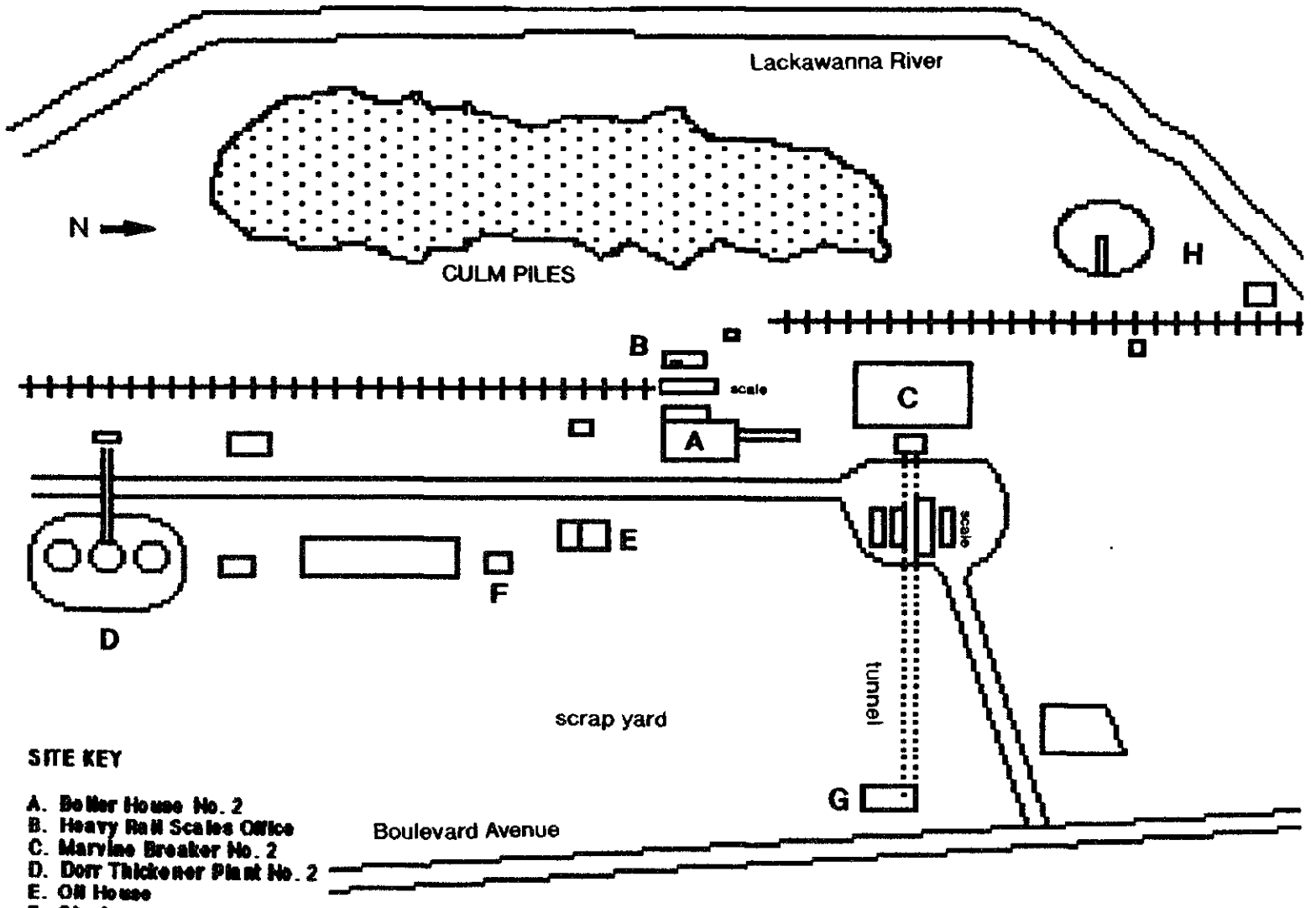


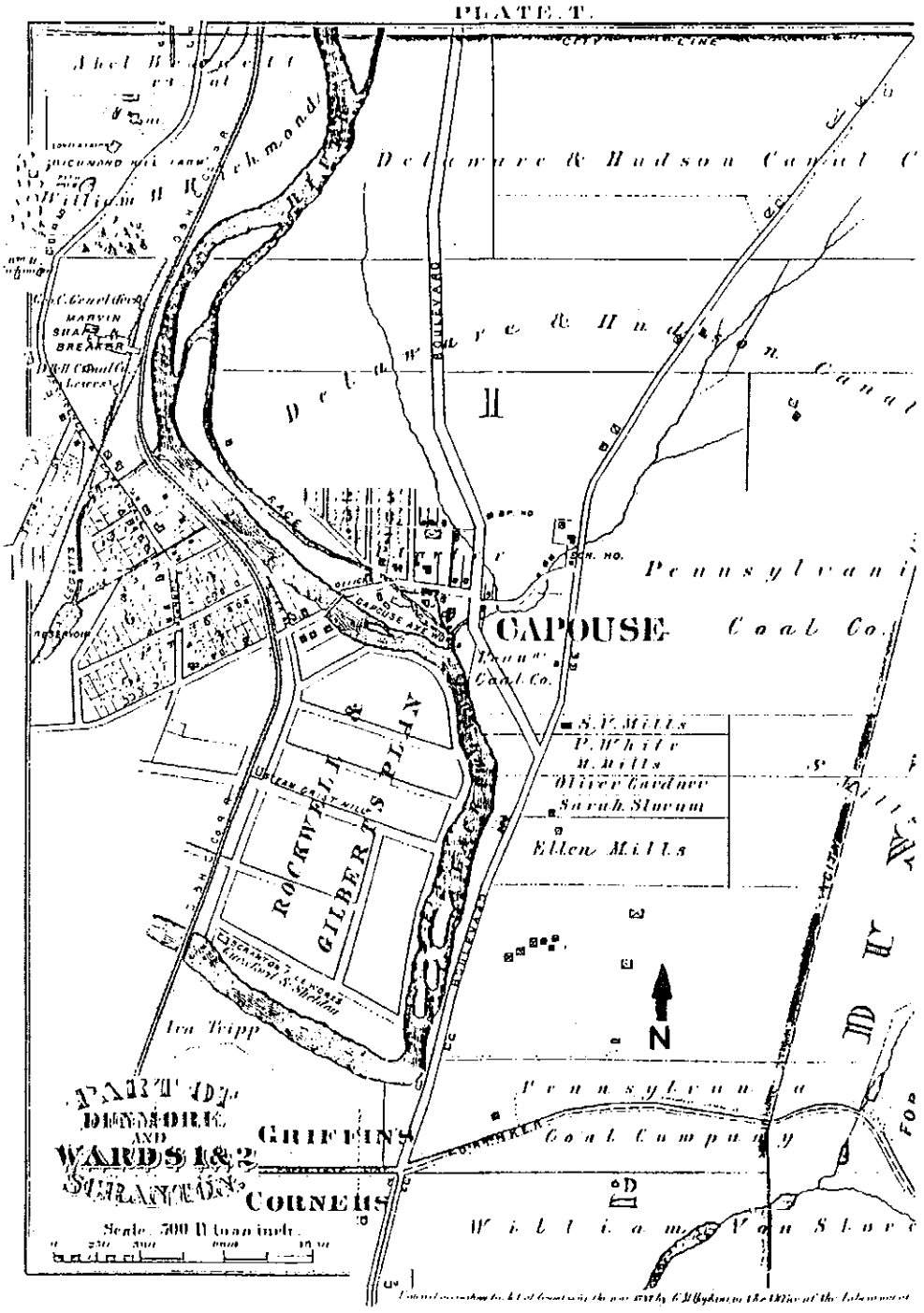
LOCATION MAP
(Site Indicated by Box)



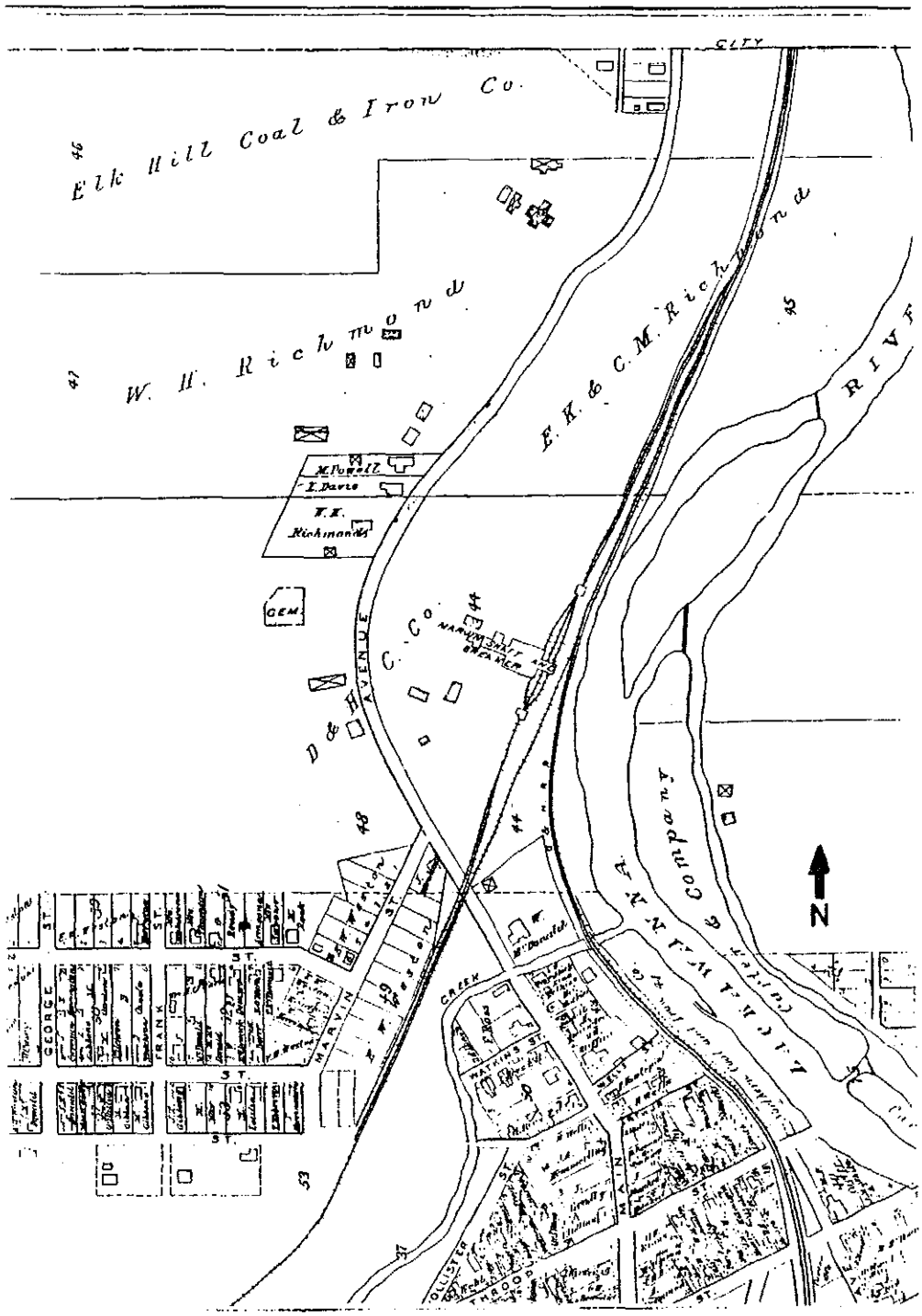
SITE KEY

A. Boiler House No. 2
B. Heavy Rail Scales Office
C. Marvine Breaker No. 2
D. Dorr Thickener Plant No. 2
E. Oil House
F. Shed
G. Fan House No. 2
H. Washery Pump

MARVINE COLLIERY SITE PLAN
1990

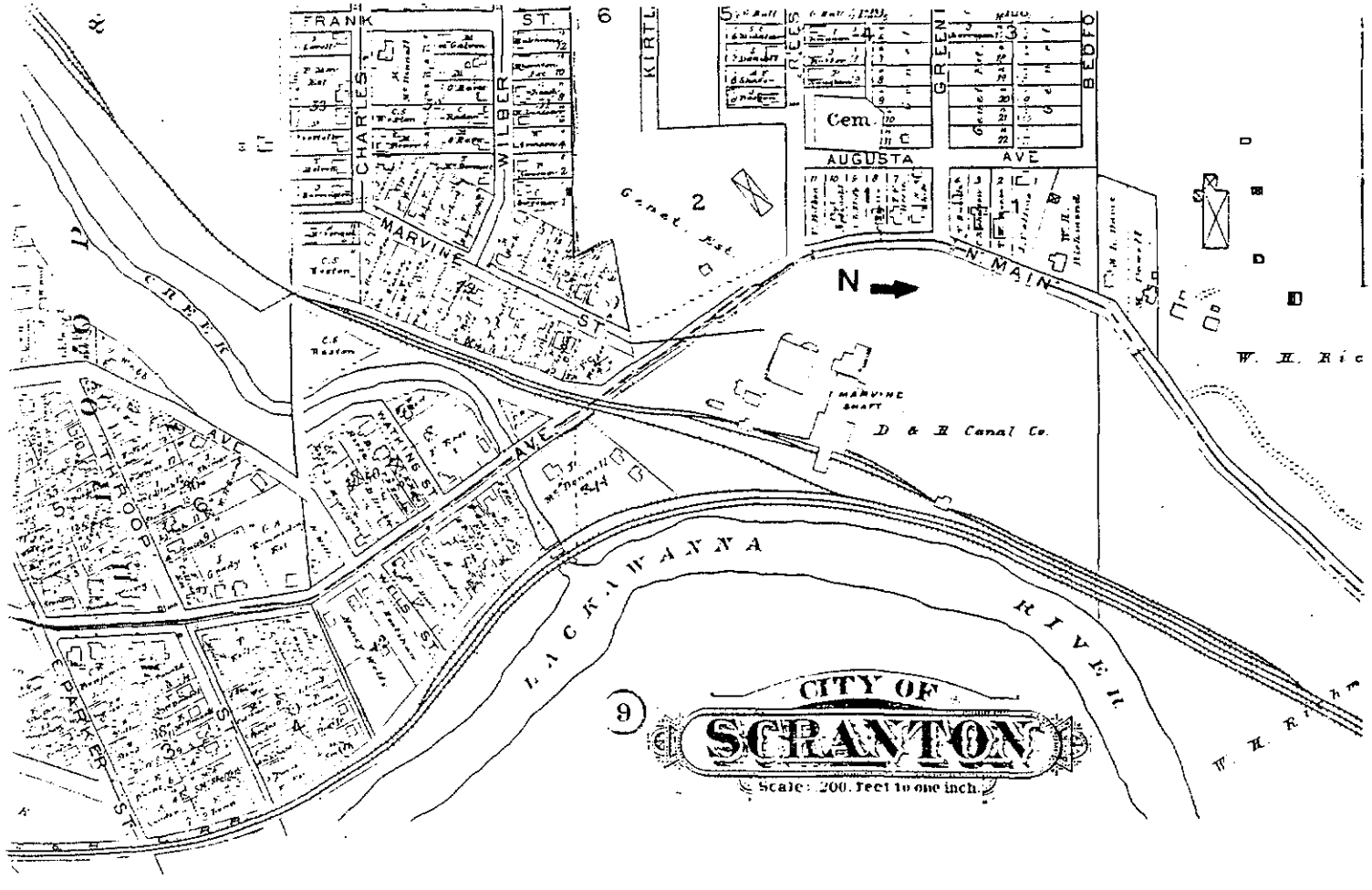


MARVINE COLLIERY SITE EVOLUTION
1877 HOPKINS CITY ATLAS OF SCRANTON



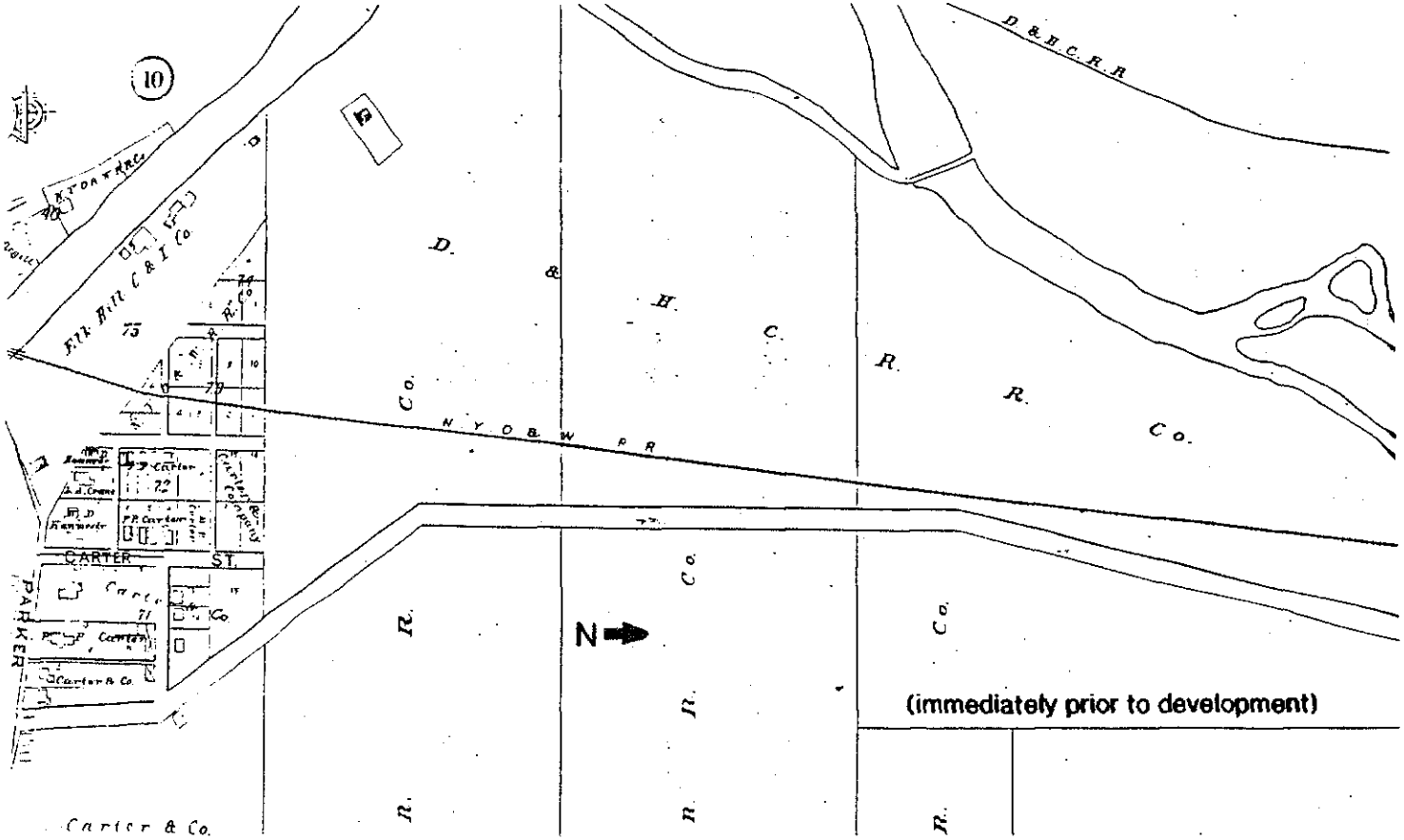
MARVINE COLLIERY SITE EVOLUTION

1888 HUNTER & HOWELL ATLAS OF THE CITY OF SCRANTON



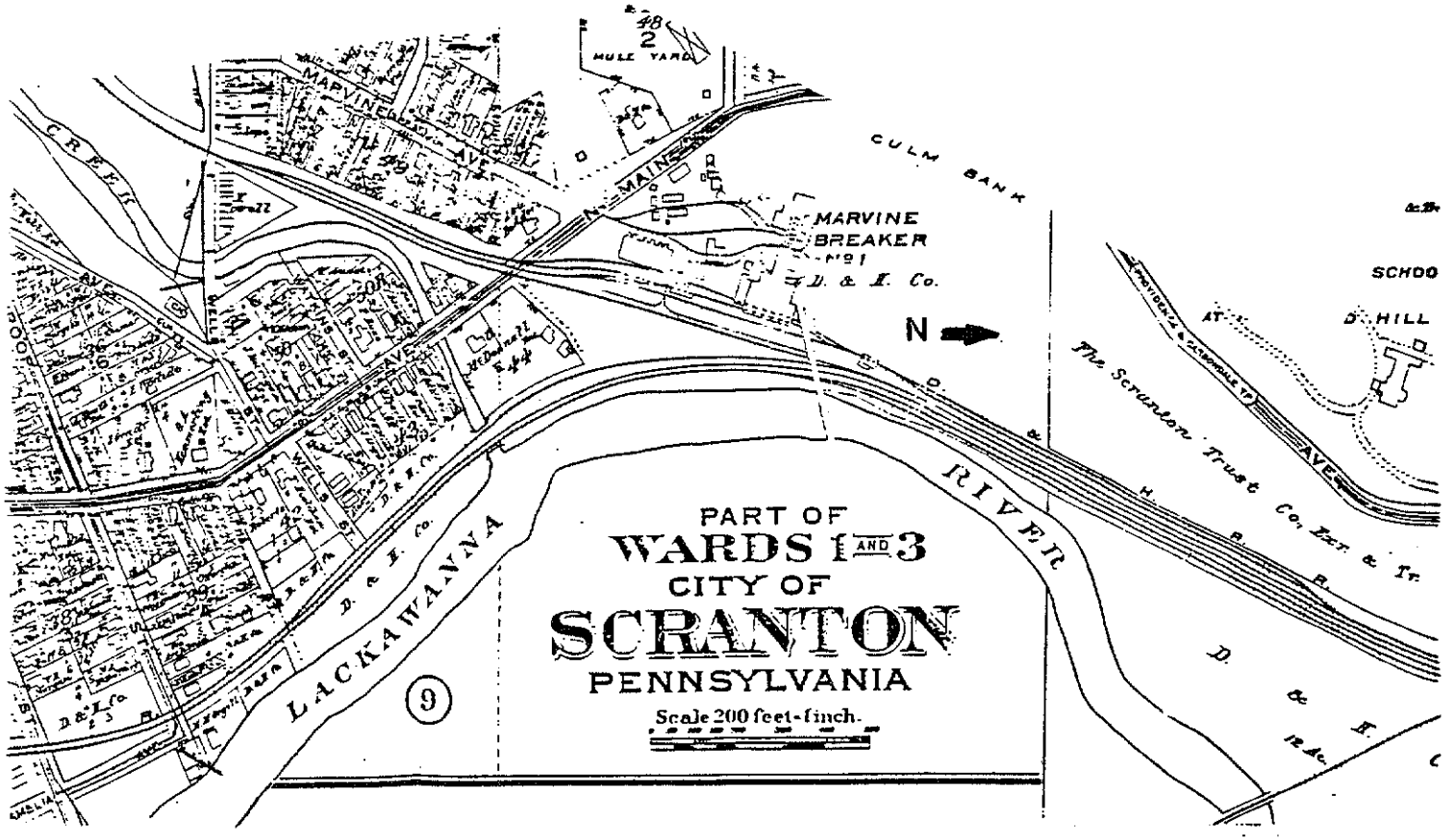
MARVINE COLLIERY WEST SITE EVOLUTION

1898 BARTL & SMITH ATLAS OF SURVEYS OF THE CITY OF SCRANTON



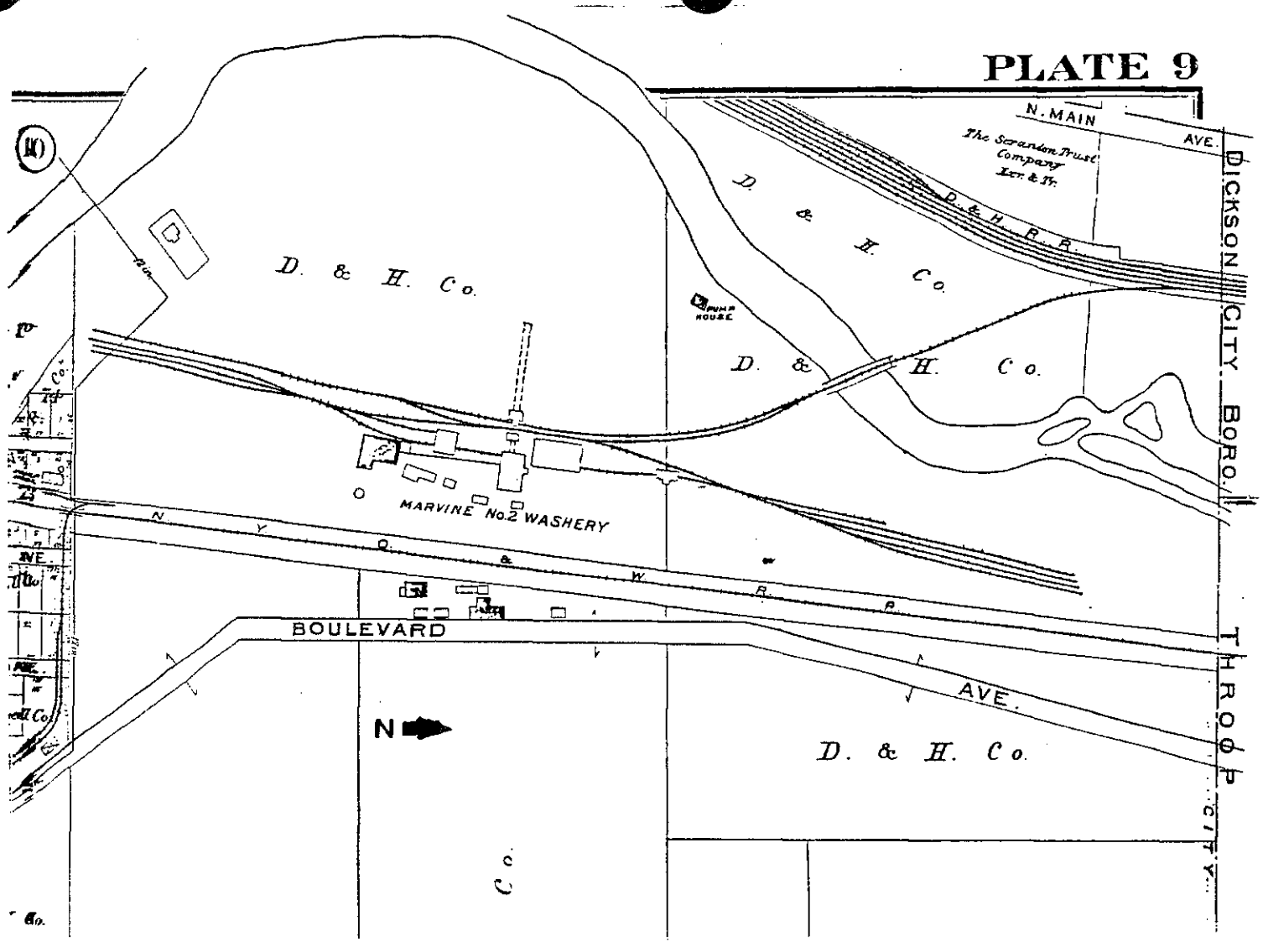
MARVINE COLLIERY EAST SITE EVOLUTION

1898 BARTL & SMITH ATLAS OF SURVEYS OF THE CITY OF SCRANTON



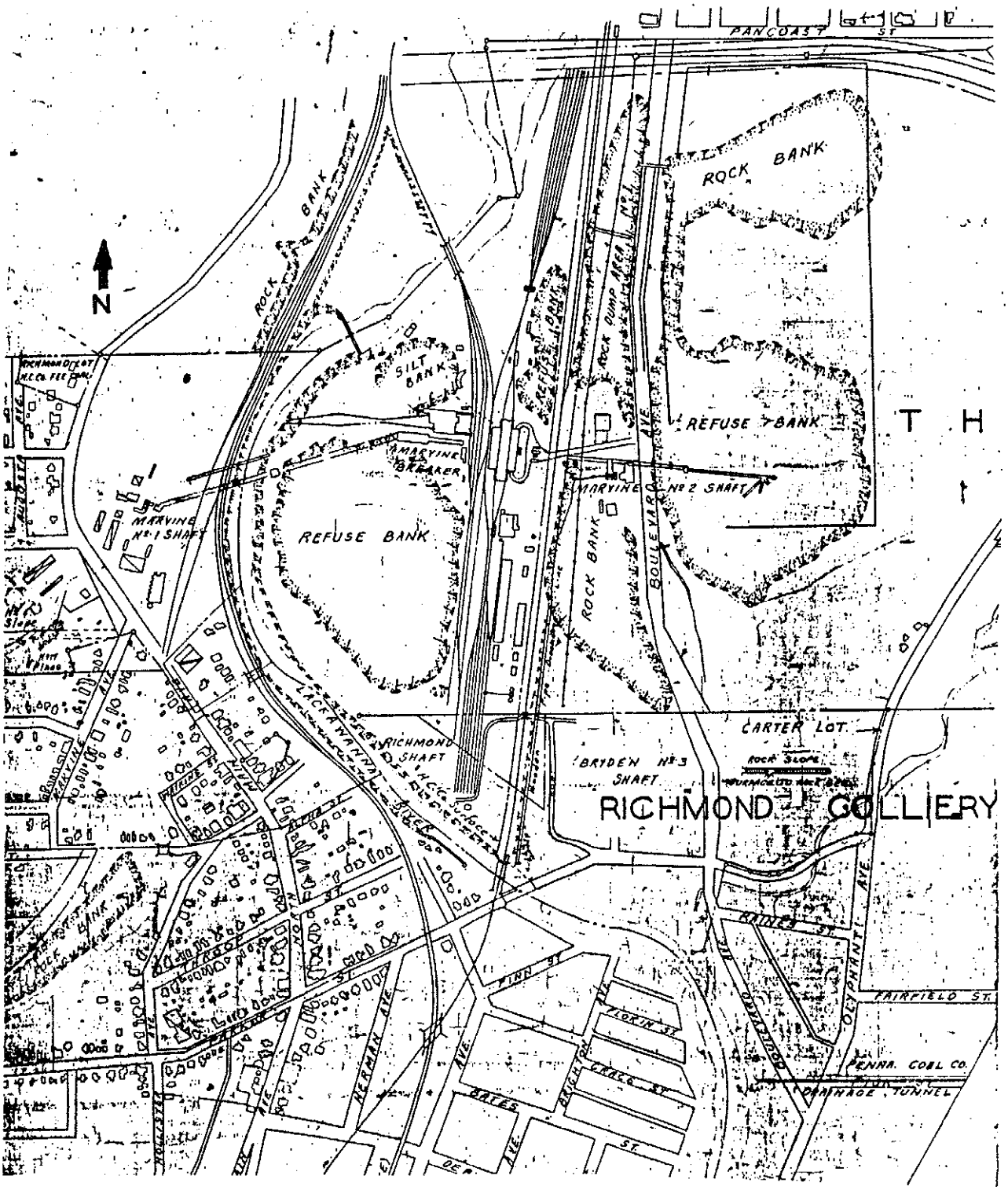
MARVINE COLLIERY WEST SITE EVOLUTION

1918 VOLK & KUEHLS ATLAS OF THE CITY OF SCRANTON



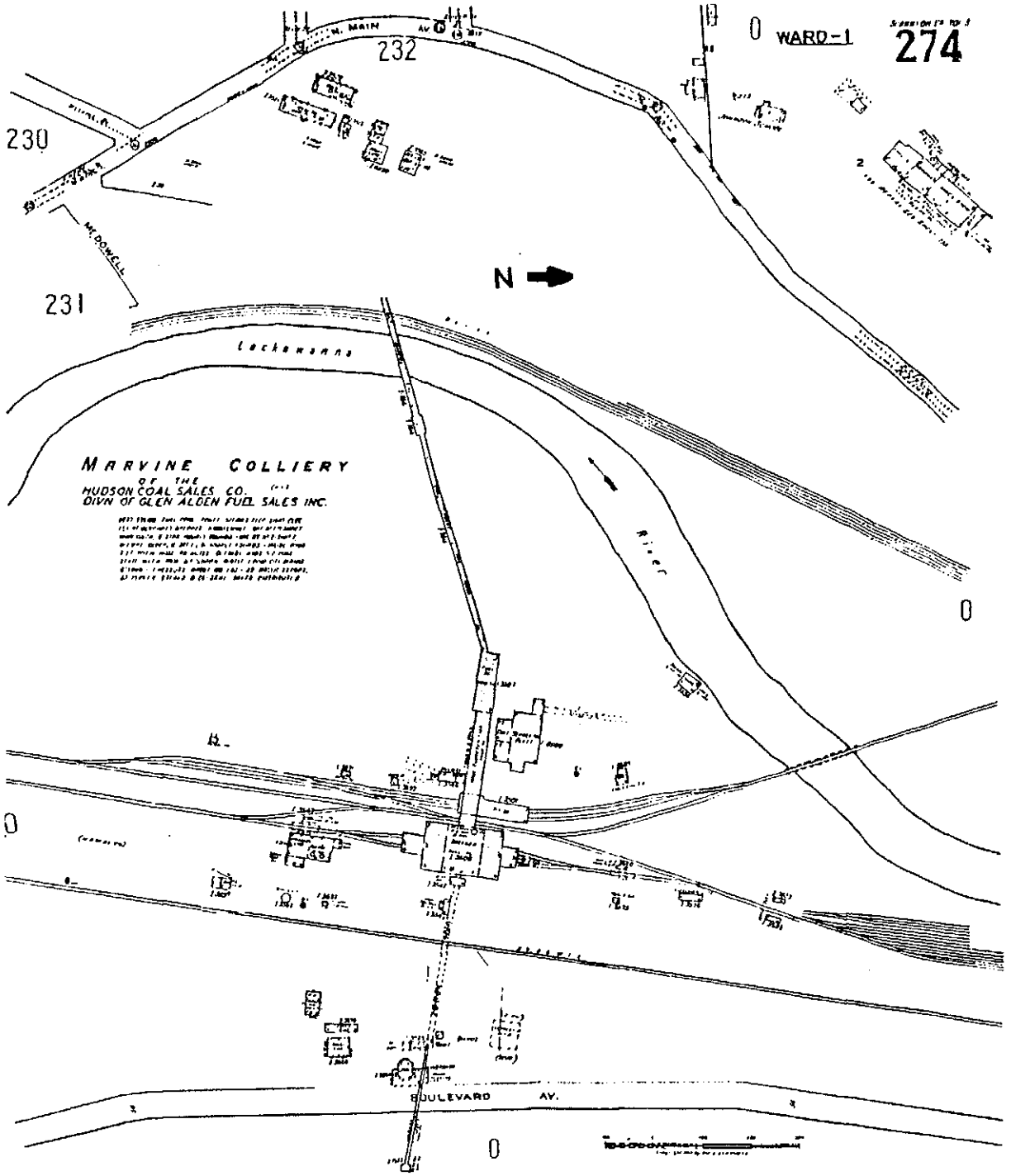
MARVINE COLLIERY EAST SITE EVOLUTION

1918 VOLK & KUEHLS ATLAS OF THE CITY OF SCRANTON



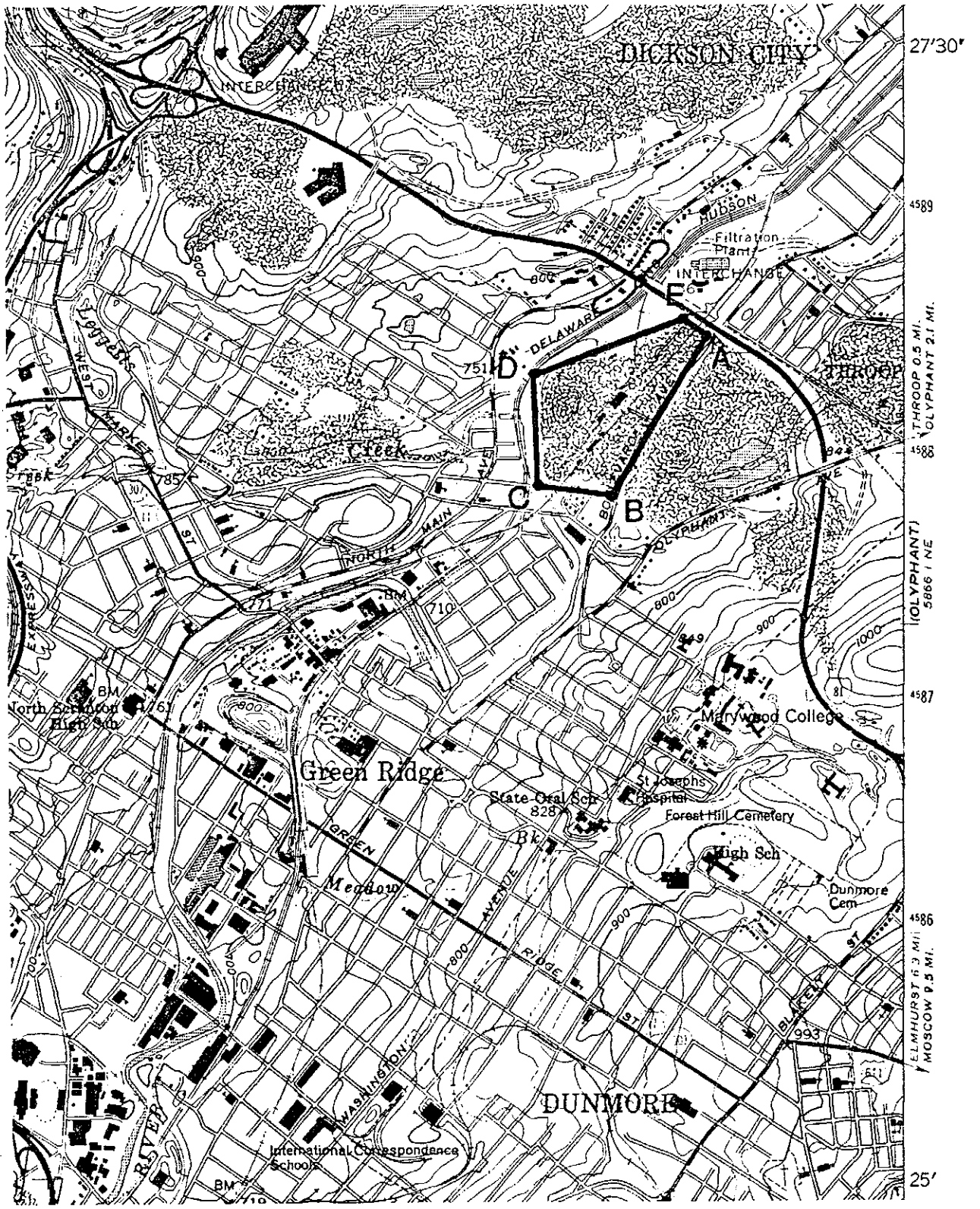
MARVINE COLLIERY SITE EVOLUTION

1945 SURFACE MAP, HUDSON COAL CO., OFFICE OF THE MINING ENGINEER



MARVINE COLLIERY SITE EVOLUTION

1956 SANBORN INSURANCE MAP OF SCRANTON



MAP: UTM SITE COORDINATES